DOCUMENT RESUME

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ABSTRACT

The teacher inservice education course described is designed for elementary school teachers planning to introduce their pupils to the use of the metric system. An outline of the contents of the course is given as well as a description of the activities involved. Ordering information for materials and a critique of the course are included. (JD)

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DESCRIPTION OF TEACHER INSERVICE EDUCATION MATERIALS

SUMMARY INFORMATION

Title: EXPERIENCES IN THE METRIC SYSTEM

Publication Date(s): Copyright 1976

Intended Users: Preservice or inservice teachers interested in an introduction to the metric system as well as practical ideas for presenting metric topics to children

Grade Level(s): Primarily for the elementary level; although could be used by anyone desiring an introduction to metrics

Number: Individual or group

Primary Focus: The intent of the product is to introduce users to the metric system by first explaining its history, its attributes, and a rationale for U.S. conversion to SI (International System of Units), and then by allowing the user to, as the title suggests, gain experience in the system by practical application of metric units.

School subject(s) and/or inservice topic(s) covered:
The school subject covered in this mini-course is mathematics, with focus on the metric system of measurement including linear, area and mass measurement. Inservice topics include increased understanding of the metric system and approaches to presenting metrics in the classroom.

What participant does in using the materials: The participant reads through the beginning question/answer session for a basic introduction to metrics. He/she then proceeds to "Experiences in metrics", a series of activities and measurement problems (selected answers are given in the appendix). A short section on conversion includes problems for the participant to answer, followed by several suggestions of games and activities which could be used to present metrics to students.

Resources: This product contains a handbook, a metric ruler and a metric converter. These are the principal materials needed for this mini-course. Measurement problems often require non-included materials, but these are readily available (i. e., straws, paper clips). This mini-course can be completed individually or in groups, the latter allowing participants to compare answers and assist teammates.

Describer critique: Experiences in the Metric System provides a brief activity-based approach to learning metrics supported by relevant problems and good examples. Its use in the community, however, is somewhat restricted by some sex bias and especially the low maturity level of the colloquial language used to create a relaxed, free atmosphere. Participants looking for a fun approach to metrics would find this refreshing while those desiring a more sophisticated approach may want to consult another source

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1.0 PURPOSES:

Rationale

As a rationale for this product, the developer states: "EXPERIENCES IN THE METRIC SYSTEM concentrates on experiences wih the metre, the kilogram, and the common unit of volume, the litre. Mastery of these three units and their interrelationships will provide an adequate understanding of the modern metric system for everyday life. It also provides a basis for an in-depth study of SI... (This minicourse) is the answer to repeated requests from teachers for a practical short course on the metric system."

It is indirectly stated that since the United States is committed towards the metric system (as of Dec. 23, 1975), teachers must be prepared in this area. The minicourse EXPERIENCES IN THE METRIC SYSTEM provides a brief, practical introduction to the main measurement units used in the metric system. Also included are suggestions of activities that the teacher could use to present metric topics to the students.

2.0 CONTENT — Scope and Sequencing of Topics:

The product consists of a 69-page manual, a paper metrestick, and a metric converter. The contents of the manual, Experiences In the Metric System, are listed below:

Chapter 1: Questions and Answers (pp. 1-15)
Chapter 2: Metric System Experiences
1. Nonstandard Linear Measurement (pp. 16-17)
2. The Metre (pp. 18-21)
3. Linear Metric Measurement (pp. 22-23)
4. Linear Measurement Projects (pp. 24-28)
5. Metric Area Measurement (pp. 29-30)
6. Metric Area Measurement Activities (pp. 31-35)
Chapter 3: Living With a Dual System
Conversion Problems (pp. 50-51)
Conversion Tables (p. 52)
Chapter 4: Potpourri
Metric Card Games (pp. 53-54)
Sample Card Games (pp. 55-56)
Metric Measurement Games (pp. 56-59)
A Plumber's Delight (p. 60)
Metric Munching (pp. 61-64)
See the USA in a Metric Way (pp. 65-67)
Appendix - Selected Answers

Inservice and preservice teachers with limited exposure to the metric system are advised to proceed in the order outlined here. Inservice teachers with some experience in metrics may want to skip areas in which they are proficient (i. e., linear metric measurement). Teachers who are well acquainted with metrics may want to solve equations for additional practice or explore the teaching ideas given in chapter 4. Experienced teachers interested in an in-depth study of metrics may want to consult additional sources, as this is primarily an introduction to basic metrics.

3.0 ACTIVITIES AND RESOURCES INVOLVED IN USE OF PRODUCT

3.1 Description of main *inservice* activities:

The participant reads through the beginning question and answer session to get a basic introduction to the metric system.

S/he then proceeds to "Metric System Experiences", which require computations and applications of the metric system (linear, area and mass measurement). Activities are included within each set of problems. Next, the participant works problems in conversion (mainly from the English system to the metric system). The remainder of the booklet provides possible ideas for teachers who are presenting metric topics to students and an appendix of selected answers.

3.2 Help given in use of product:

No further instructions are needed other than those presented in the 69-page mini-course manual/workbook combination.

4.0 EVALUATION OF TEACHER INSERVICE LEARNING

Evaluation is provided throughout by means of equations in different metric units. Selected answers are given in the appendix to provide the participant with an accurate check for a chosen portion of the problems. In addition, a self-test is provided toward the end of the handbook by which users can assess their own competency in applying the system. If the mini-course is completed in groups, answers may also be compared with those of other participants.

5.0 ORDERING INFORMATION

5.1 Resources required/recommended for implementing product:

The kit contains the handbook, converter and ruler. These are the principle items needed for completion of this mini-course. Measurement activities require materials which are not included but are easily accessible (i. e., straws, paper clips, coins,classroom, etc.). Each participant will need his/her own module kit, but participants may want to work in groups to compare answers and assist other members who may be experiencing difficulty. The mini-course may be completed on an individual basis without difficulty. Printed material is easy to understand and allows participant to proceed at his/her own learning rate.

5.2 Distributor name/address:

Paul S. Amidon and Associates, Inc.
1966 Benson Avenue
St. Paul, Minnesota 55116

(612) 690-2401

5.3 Components/approximate costs:

Component	Purchase	Rental	No. Req.	Reusable
Experiences in the Metric System	$2.95	No	1/participant	No
includes:				
book, converter, tape measure				
also available but not required:				
classroom set of 35 metric converters	$29.95	No	1/class of 35	Yes

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6.0 HISTORY OF DEVELOPMENT

6.1 Identification of the developer:

The developer is identified below:

Dr. Herbert N. Johnson is Head of the Department of Mathematical Science at Winona State University, Minnesota. Assisting him on the development of the product was Ms. Martha Roberson, who was graduated from Winona State University in 1972 with a Bachelor of Science degree in Mathematics and Physics. She was employed by the University during the academic year 1972-1973 as a Graduate Assistant and served as Director of the College's Mathematics Laboratory in 1973-1974.

6.2 How developed and when:

Regarding development of the product, the authors note:

"The second edition of EXPERIENCES IN THE METRIC SYSTEM is the natural outgrowth of extensive classroom experience with the first edition. Significant changes include strict adherence to SI-approved terminology and spelling, new field-tested problems, new experiences in mass and volume, and a new Metric Converter." The copyright date for this edition is 1976.

6.3 Evidence of effectiveness with users:

Both the promotional literature and the preface to the manual state that this product has been field tested and revised according to the above observations. However, the project developers provided no formal field test results.

DESCRIBER CRITIQUE

Appropriateness / adaptability / technical quality:

An introduction to metrics is certainly appropriate, applicable information for every teacher. Experiences in The Metric System provides a good, practical course in basic metric measurement. Although geared towards elementary teachers, it would be appropriate for any teacher interested in an understanding of the metric system. Some argument could be made against the appropriateness of the section on conversion ---- this seems to contradict with the author's statement that one should "think Metric". The describer believes that this section could be omitted without detracting from the product. Also, questions including some type of conversion (i. e., pg. 11:"A metre is just a little more than a yard" could be adapted to make comparisons between a measurement (metric) and an object.)
Technical quality is good. Print is spaced well and the manual is easy to read.

Content accuracy/social fairness/community acceptance issues:

The describer found one discrepancy in the product on page 42, where it is stated: "A smaller unit of volume is the litre defined as ONE CUBIC DECILITRE (10 cm x 10 cm x 10 cm)". To be accurate the statement should read that the LITRE is defined as ONE CUBIC DECIMETRE. However, the describer did not find this type of discrepancy to be a typical occurrence.

There does not appear to be any major problem of social fairness, although some persons may object to the use of "he" and "his" in reference to a subject who may be male or female. Some persons may object to the low maturity level of the language used. The intended humor on page 24 "(Yes, Virginia, a square is a rectangle)" may be more offensive than humorous as it could give a degrading appearance to women in general.

Overall summary/comment:

Experiences in the Metric System provides an informal introduction to the basic metric measurements (linear, area, volume). Good examples are given such as on page 12 where the metric prefixes are related to money. The colloquial language is used no doubt to create a free, relaxed atmosphere; however, the language may appear immature and unsophisticated to some participants. Comments such as "Give it to me straight" and "Right on" are typical examples of what appears frequently throughout the handbook. Some persons may object to the appearance of a section on conversion, as some educators argue that this prevents the participant from "thinking" in metrics. Although unintended, the degree of sex bias/stereotyping may also restrict the use of this product in some communities.

JW - 6/77